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PATENT APPLICATION
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION OF
CHRISTIAN WAMPRECHT ET AL
SERIAL NUMBER: 10/092,077
FILED: MARCH 6, 2002
TITLE: NEW POLYURETHANES AND THEIR USE FOR THE THICKENING OF AQUEOUS SYSTEMS

GROUP NO.: 1714
EXAMINER: P. D. NILAND

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This Appeal was commenced by a Notice of Appeal filed on October 26, 2005. This Appeal Brief is filed three months from the filing date of the Notice of Appeal on October 26, 2005. A one-month Petition for Extension of Time is concurrently submitted herewith. The Notice of Appeal appeals the final rejection of Claims 1-12.

The headings used hereinafter and the subject matter set forth under each heading is in accordance with 37 C.F.R.§41.37(c).

CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.

Jennifer R. Seng Reg. No. 45,851
Name of applicant, assignee or Registered Representative

Signature

January 26, 2006
Date

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I. REAL PARTY IN INTEREST

Christian Wamprecht, Jan Mazanek, Peter Manshausen and Frank Sauer are the only inventors of the invention described and claimed in the above-identified application. These inventors have assigned all rights, title, and interest in the invention of the application to Bayer Aktiengesellchaft, a corporation of Germany, as evidenced by assignment which was filed with the United States Patent and Trademark Office (USPTO) and recorded on June 3, 2002 at reel 012949, frame 0005.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to the Appellants, the Appellants' legal representative or Assignee, which will directly affect or be directly affected by or have a bearing on the Board's decision in this pending Appeal.

III. STATUS OF CLAIMS

Claims 1-12 remain pending in the present application and are currently rejected. No Claims have been canceled. The claims on Appeal are pending claims 1-12.

Particularly, Claims 1-12 stand rejected under 35 U.S.C. §103(a) as the Examiner considers them to be obvious over U.S. Patent No. 4,079,028 to Emmons et al.

Claims 1-12 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting over Claims 1-12 of co-pending U.S. Application No. 10/092,212 to Wamprecht et al.

Claims 1-12 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting over U.S. Patent No. 6,642,302 to Wamprecht et al.

IV. STATUS OF AMENDMENTS

The Amendment filed on August 8, 2005 in response to the Office Action dated March 7, 2005, was entered. The claims on Appeal are pending claims 1-12 listed in the Amendment of August 8, 2005, and included in the Claims Appendix.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claims of the present application are directed to polyurethanes and their use for thickening of aqueous systems.

One group of claims on appeal is directed to a water soluble or water dispersible polyurethane, as described in detail on page 2, lines 24 to page 3, line 2, and page 7, line 25 to page 8, line 26 and page 9, line 16 to page 11 line 6. Examples of described polyurethanes are provided on page 15, line 23 to page 17, line 6.

Another group of claims is directed to a process for making a water soluble or water dispersible polyurethane, as described in detail on page 3, lines 3 - 15 and page 3, line 17 to page 7, line 24 and page 8, line 27 to page 9, line 15. Examples of the process for creating described polyurethanes are provided in Examples 1 – 9 on page 11, line 8 to page 14, line 29.

Another group of claims is directed to a composition of matter that is a polyurethane thickener, as described in detail on page 9, line 23 to page 10, line 3 of the specification as originally filed.

VI. GROUND OF REJECTIONS TO BE REVIEWED ON APPEAL

I. Whether Claims 1 - 12 are unpatentable under 35 U.S.C. §103(a) over U.S. Patent No. U.S. Patent No. 4,079,028 to Emmons et al. (hereinafter "Emmons")?

II. Whether Claims 1 - 12 should be held provisionally rejected under the judicially created doctrine of obviousness-type double patenting over Claims 1-12 of co-pending U.S. Application No. 10/092,212 to Wamprecht et al. (hereinafter "Wamprecht '212")?

III. Whether Claims 1 - 12 should be held provisionally rejected under the judicially created doctrine of obviousness-type double patenting over U.S. Patent No. 6,642,302 to Wamprecht et al. (hereinafter "Wamprecht '302")?

VII. ARGUMENTS

The Arguments made in the Amendments dated August 8, 2005 in response to the Office Action dated March 7, 2005 are hereby incorporated by reference. Each ground of rejection presented for review is addressed hereinafter under the appropriate heading.

To determine obviousness, a four part test, as set forth in *Graham v. John Deere Co.*, is employed to examine the: (i) content and scope of the prior art; (ii) level of ordinary skill in the art; (iii) differences between the prior art and the claimed invention; and (iv) objective evidence of non-obviousness.[1] To establish a *prima facie* case of obviousness, there must be some suggestion or motivation to combine the references, there must be some reasonable expectation of success based upon the teachings of the references and the prior art references, when combined, must teach or suggest all of the claim limitations.[2] In order to rely on a reference under 35 U.S.C. § 103(a), the reference must be analogous prior art.[3]

In order to rely on a reference as a basis for rejection of the claimed invention, the reference must either be in the field of the inventor's endeavor or be reasonably pertinent to the particular problem with which the inventor was concerned.[4] Generally, a reference may be considered reasonably pertinent if, even though it is in a different field, it is one in which logically would have commended

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[1] *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966); *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1320 (Fed. Cir. 2004).

[2] MPEP 2143.

[3] *In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992).

[4] *Oetiker*, 977 F.2d at 1447; *see also In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992). In *In re Clay*, the Court held that the reference at issue could not be considered to be within the inventor's field of endeavor "merely because both relate to the petroleum industry." *Id.* The prior art reference taught the use of a gel in irregular volumes within underground, natural oil bearing formations to direct flow under extreme conditions, whereas the invention at issue taught introduction of gel to a confined volume in a man-made storage tank at ambient temperature and atmospheric pressure. *Id.* Based upon the teachings, the Court found that the field of endeavor of the prior art reference was "*extraction* of crude petroleum" whereas the inventor's field of endeavor was the "*storage* of refined liquid hydrocarbons." *Id.*

itself to an inventor's attention in considering the problem.[5] The similarities and differences in structure and function of the inventions carry great weight in determining whether references are of analogous or non-analogous art.[6]

I. CLAIMS 1-12 ARE NOT OBVIOUS UNDER 35 U.S.C. §103(a) OVER EMMONS.

Emmons discloses a polyurethane thickener which is the reaction product of diisocyante, polyether polyol having 3 or more OH groups, monoalcohol and monoamine.

Claims 1 and 8

Appellants contend that the Examiner is incorrect in his understanding of Emmons, and Emmons clearly does not render the present claims obvious. In particular, Emmons fails to teach or suggest the combination of components of or the process for creating compound A) in the process recited in independent Claims 1 and 8. The Examiner states that the reaction of diisocyanate with polyether polyols with 3 OH groups will inherently produce polyether polyols with 4 or more OH groups suggesting that the limitations of independent Claims 1 and 8 serve only to point out intermediates that are inherent to the process disclosed by Emmons. Appellants disagree with the Examiner.

Emmons fails to teach or suggest the additional step in the production of polyurethanes of creating a polyether alcohol mixture of polyether polyols with an average functionality of ≥ 3 and polyether polyols with an average functionality of ≥ 4 by a partial reaction of up to 50 mole % of polyether polyols with an average functionality of ≥ 3 with isocyanates with an average functionality of ≥ 2 taught or suggested. In his discussion of component A of independent Claims 1 and 8, the Examiner states that statistically, two of these polyether polyols will be joined by a diisocyanate in the final polyurethane of the reference creating a tetrol polyurethane polyether moiety that would read on component a2 of independent Claim 1 and 8. Within this statement, the Examiner is asserting that placing polyisocyanates and polyether polyols in the same reaction is equivalent to preparing a mixture of

[5] *Clay*, 966 F.2d at 659.

[6] *See* MPEP 2141.01(a).

polyether polyols by performing a partial reaction of up to 50 mole % of polyether polyols with an average functionality of ≥ 3 with isocyanates with an average functionality of ≥ 2, and any polyether polyol that is encompassed in Emmons that is combined with polyisocyanate in a polymerization reaction is equivalent to component A) of independent Claims 1 and 8. Clearly, a polyether polyol of single functionality is not equivalent to a mixture of polyether polyol with average functionality of ≥ 3 and ≥ 4 as recited in component A) of independent Claims 1 and 8. While statistically there may be a number of polyether polyols that are joined to form polyether polyols with functionality of ≥ 4 in a reaction containing polyether polyol and polyisocyanates, the object of component A) is a mixture containing ≤ 50 mole % polyether polyols with average functionality ≥ 4, the necessary consequence of reacting up to 50 mole % polyether polyols with average functionality of ≥ 3 with polyisocyanates. Reactions such as those alluded to by the Examiner would produce only a fraction of polyether polyols with average functionality of ≥ 4 described in independent Claims 1 and 8. Therefore, the Examiners assertion that any mixture containing polyether polyols and isocyanates, including those mixtures containing other components, will produce the same mixture of polyether polyols with an average functionality of ≥ 3 and polyether polyols with an average functionality of ≥ 4 that is produced by the partial reaction, is clearly erroneous.

Furthermore, Emmons provides no teaching or suggestion that would make it obvious to one of ordinary skill in the art to prepare a mixture of polyether polyols recited in component A) of independent Claims 1 and 8 to produce a polyurethane thickener with improved high shear viscosity. Emmons fails to teach or suggest the additional step in the producing of polyurethanes of preparing a polyether polyol mixture with an average functionality of ≥ 3 and ≥ 4 by a partial reaction of up to 50 mole % of polyether polyols with an average functionality of ≥ 3 with isocyanates with an average functionality of ≥ 2, nor would it be obvious form the disclosure of Emmons to use such a mixture to increase the high shear viscosity of the polyurethane thickener.

Moreover, the Examiner's suggestion that Emmons encompasses the instantly claimed component A) is incorrect. Examples of polyurethane thickeners in latex paints described in independent Claims 1 and 8 and their viscosities determined at low shear are provided in Examples 1-9 of Table 1 of the specification. The viscosities at low shear for these Examples is between 21100-35000 mPa·s or

174 to 182 KU. Emmons provides examples of similar polyurethane thickeners in latex paint in table 16. The viscosity of these paints has been determined at low viscosity to be between 61 and 141 KU. The viscosity of latex paints including the polyurethane thickeners of independent Claims 1 and 8 is clearly better at low viscosity than those of Emmons. Therefore, the polyurethane thickeners of independent Claims 1 and 8 display improved viscosity over Emmons and moreover established that Emmons does not encompass the polyurethanes of the present claimed invention and, therefore, cannot render independent Claims 1 and 8 obvious.

Accordingly, Emmons fails to teach or suggest all of the limitations of independent Claims 1 and 8. Furthermore, the polyurethane thickeners described in independent Claims 1 and 8 provide improved properties over Emmons. Moreover, Emmons fails to teach the combination of steps recited in independent Claims 1 and 8 and teaches away from using a combination of compounds such as those recited in independent Claims 1 and 8. Emmons therefore cannot be used as the basis of a rejection under 35 U.S.C. 103(a).

Claims 2-7 and 11-22, and Claims 9 and 10 depend from and add further limitations to independent Claims 1 and 8, respectively, and are deemed to be allowable for at least the same reasons in connection with independent Claims 1 and 8.

A *prima facie* obviousness of a claimed invention, requires that all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F2d 981, 180 USPQ 580 (CCPA 1970). The Examiner has failed to show in Emmons each and every step of the claims of the present invention. Furthermore, there must be some reasonable expectation of success based upon the teachings of the prior art references to establish a *prima facie* case of obviousness (MPEP 2143). The Examiner has failed to show that Emmons provides the motivation to produce a polyurethane as recited in the present claimed invention. The preponderance of evidence clearly establishes the allowability of Claims 1-12. Reversal of the Examiner's rejections and allowance of Claims 1-12 are requested.

II. CLAIMS 1-12 SHOULD NOT BE HELD PROVISIONALLY REJECTED UNDER THE DOCTRINE OF OBVIOUSNESS-TYPE DOUBLE PATENTING OVER CLAIMS 1-12 OF WAMPRECHT '212.

Appellants submit that both the present application and Wamprecht '212 are pending. Allowable subject matter, not withstanding the provisional obviousness-type double patenting rejection, has not been indicated in either application. Where a provisional rejection under the judicially created doctrine of obviousness-type double patenting is named between two applications, MPEP 104(I)(B) states that "if the 'provisional' double patenting rejection in one application is the only rejection remaining in the application, the examiner should then withdraw that rejection and permit the application to issue as a patent, thereby converting the provisional rejection in the other application in a double patenting rejection at the time the one application issues as a patent." Therefore, it is not evident which of the pending applications will become allowable first, and any action by Appellants with this regard is premature.

III. CLAIMS 1-12 SHOULD NOT BE HELD PROVISIONALLY REJECTED UNDER THE DOCTRINE OF OBVIOUSNESS-TYPE DOUBLE PATENTING OVER CLAIMS 1-12 OF WAMPRECHT '302.

Appellants traverse this rejection on the grounds that Wamprecht '302 teaches a reaction for the production of polyurethanes that is not the same as the present claimed invention. Wamprecht '302 is directed to water soluble or water dispersible polyurethanes that contain polyether polyols, diisocyanate, monoalcohol, oximes and, optionally, monoisocyanates. Wamprecht does not teach the composition of the current claimed invention in which a polyether polyol, diisocyanate, monoisocyanate and, optionally, monoalcohol are combined. Therefore, the rejection based on the judicially created doctrine of obvious-type double patenting should be withdrawn.

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Respectfully submitted,

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VIII. CLAIMS APPENDIX

Claim 1: A water-soluble or water-dispersible polyurethane comprising a reaction product of

A) a mixture of at least one polyether polyol a1) having an average functionality of ≥ 3 and at least one urethane group-containing polyether polyol a2) having an average functionality of ≥ 4,

B) at least one C_8-C_{22} monoisocyanate,

C) at least one (cyclo)aliphatic and/or aromatic diisocyanate,

D) optionally at least one C_8-C_{22} monoalcohol, and

E) optionally at least one polyisocyanate having an average functionality of >2

wherein component C) comprises isophorone diisocyanate and the starting NCO/OH equivalent ratio is between 0.5:1 to 1.2:1 and the polyurethane has a softening point of from 10°C to 80°C and

wherein the polyether alcohol mixture A) containing polyether a1) and the urethane group-containing polyether a2) is carried out by the partial reaction of the polyethers a1) with at least one organic isocyanate having a functionality of ≥ 2 and up to 50 mole % of the polyethers a1) are reacted with isocyanates.

Claim 2: The polyurethane of Claim 1, wherein the polyether polyol a 1) has an average functionality of 3.

Claim 3: The polyurethane of Claim 1, wherein the polyether polyol a1) has an average functionality of 4 to 6.

Claim 4: The polyurethane of Claim 1, wherein component B) comprises a C_{10}-C_{18} monoisocyanate.

Claim 5: The polyurethane of Claim 1, wherein component B) comprises a C_{12}-C_{18} monoisocyanate.

Claim 6: The polyurethane of Claim 1, wherein component C) comprises a (cyclo)aliphatic diisocyanate.

Claim 7: The polyurethane of Claim 1, wherein component D) comprises a C_{10}-C_{18} monoalcohol.

Claim 8: A process for the production of a water-soluble or water-dispersible polyurethane comprising reacting

A) a mixture of at least one polyether polyol a1) having an average functionality of ≥ 3 and at least one urethane group-containing polyether polyol a2) having an average functionality of 4,

B) at least one C_6-C_{22} monoisocyanate,

C) at least one (cyclo)aliphatic and/or aromatic diisocyanate,

D) optionally at least one C_8-C_{22} monoalcohol, and

E) optionally at least one polyisocyanate having a mean functionality of > 2

wherein component C) comprises isophorone diisocvanate and the starting NCO/OH equivalent ratio is between 0.5:1 to 1.2:1 and the polyurethane has a softening point of from 10°C to 80°C.

Claim 9: The process of Claim 8, wherein the urethane group-containing polyether polyol a2) is produced by a partial reaction of the polyether polyol a1) with a diisocyanate.

Claim 10: The process of Claim 8, wherein the urethane group-containing polyether polyol a2) is produced by a partial reaction of the polyether polyol a 1) with polyisocyanates having an average functionality of 2.

Claim 11: A composition of matter comprising the polyurethane of Claim 1.

Claim 12: The composition of Claim 11, wherein the composition is a thickened aqueous paint system, an adhesive or another aqueous formulation.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.